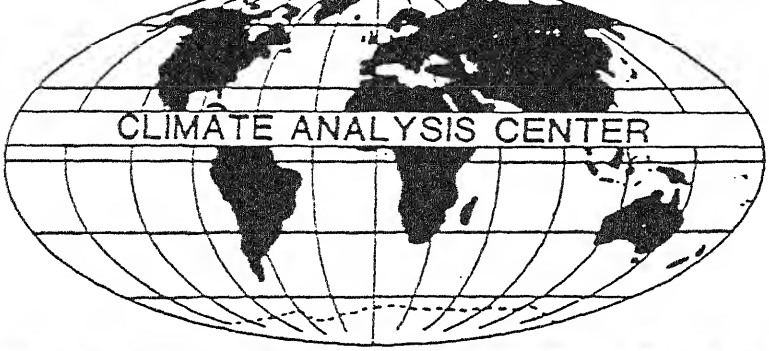
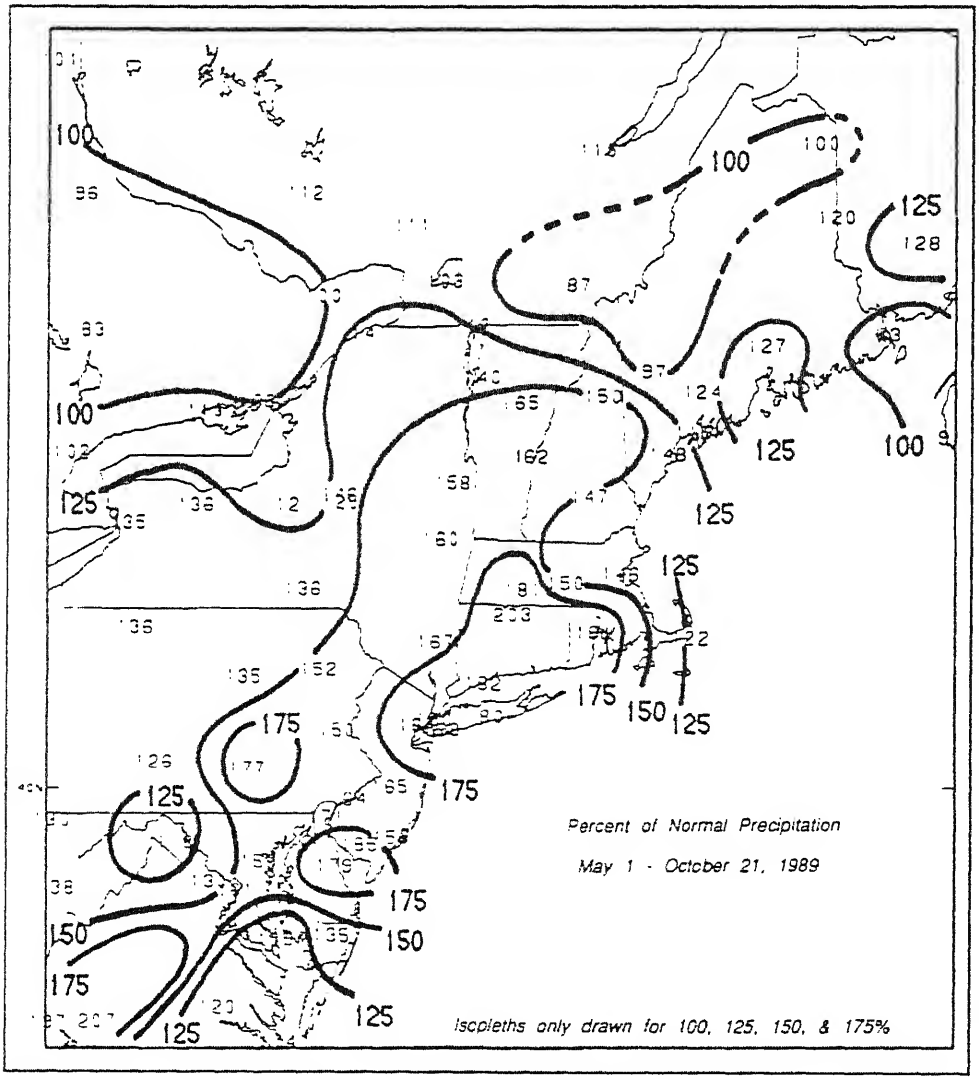


CONTAINS:
SUMMARY ON ABNORMAL DRYNESS IN SOUTHEASTERN AUSTRALIA

WEEKLY CLIMATE BULLETIN

No. 89/42 Washington, DC October 21, 1989



AFTER AN EXTREMELY DRY, MILD, AND RELATIVELY SNOWLESS WINTER IN THE NORTHEAST, AMPLE PRECIPITATION HAS FALLEN ACROSS MUCH OF THE REGION SINCE MID-SPRING AND HAS CONTINUED INTO THE EARLY AUTUMN. MANY LOCATIONS HAVE MEASURED MORE THAN ONE AND A HALF TIMES THE NORMAL PRECIPITATION SINCE MAY 1. FOR FURTHER DETAILS, REFER TO THE UNITED STATES WEEKLY CLIMATE HIGHLIGHTS.

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE - NATIONAL METEOROLOGICAL CENTER
CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- U.S. cooling degree days (summer) or heating degree days (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every three months).
- Global three-month temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF OCTOBER 21, 1989

1. *Central United States and Eastern Mexico:*

DRY CONDITIONS DEVELOP.

More than three dozen stations throughout the central U.S. have measured no precipitation in over 4 weeks. While the remnants of Hurricane Jerry did provide some significant rains to extreme southeastern Texas, the aerial coverage was limited as the storm weakened rapidly after making landfall [5 weeks].

2. *Eastern U.S.:*

PRECIPITATION REMAINS PLENTIFUL.

A strong upper air trough combined with tropical moisture from the remnants of Hurricane Jerry to produce widespread rainfall from southern New England and the mid-Atlantic to Kentucky. Flooding was reported in the latter region early in the week when as much as 150 mm fell in a 24- hour time span. More than 168 mm doused parts of New York while isolated storms left sections of eastern Georgia with nearly 188 mm [8 weeks].

3. *France, Spain, Portugal, and Northern Italy:*

MOISTURE SHORTAGES LINGER.

Rains increased along western and southeastern France and northwestern Spain as 20 to 30 mm was observed. Meanwhile, other areas of France, Spain, and Portugal measured less than 10 mm while northern Italy was dry [6 weeks].

4. *Turkey:*

REGION TURNS WET.

Many parts of the country have received significant rainfa past weeks, including the more arid regions. Weekly tota great as 148 mm were more than eight times the normal am at a few locations [4 weeks].

5. *Japan:*

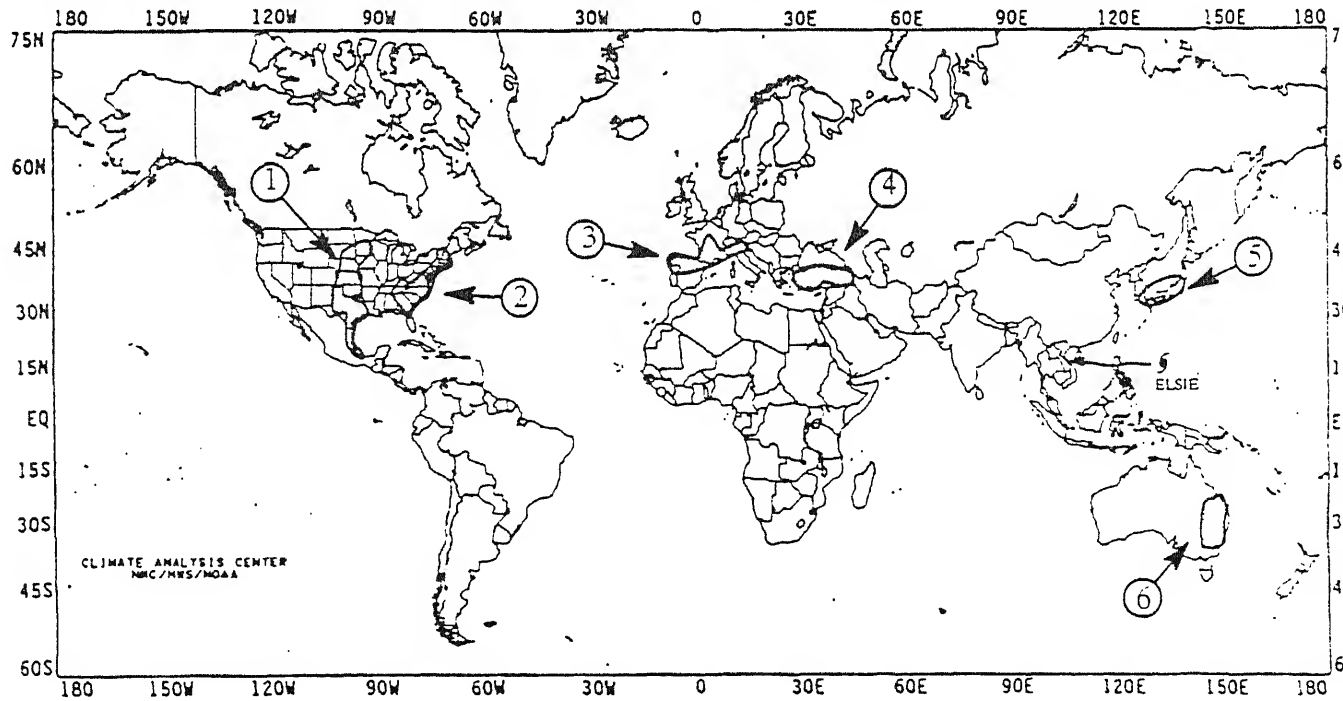
ABNORMAL WETNESS FINALLY CEASES.

Following more than 6 weeks of abundant rainfall that occu in August and early September, moisture returned to n normal levels as near to slightly sub-normal rains have pers in recent weeks [Ended at 10 weeks].

6. *Eastern Australia:*

SPRING RAINS REMAIN MEAGER.

Little to no precipitation (less than 10 mm) was observe eastern Queensland and New South Wales. In fact, m stations have accumulated less than 10 mm for the entire pe (see Special Climate Summary) [8 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation amounts and temperature departures are this week's values.

MAP: Approximate locations of major anomalies and episodic events are shown. See other maps in this Bulletin for current two week temperatu anomalies, four week precipitation anomalies, long-term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF OCTOBER 15 THROUGH OCTOBER 21, 1989

After much of the lower 48 states experienced relatively tranquil, dry, and mild weather during the second week of October, record cold air, early-season heavy snowfall, severe thunderstorms, copious amounts of rain, and Hurricane Jerry afflicted various portions of the central, southern, and eastern U.S. last week. Early in the week, Hurricane Jerry, with maximum sustained winds of 85 mph, made landfall near Galveston, TX early Sunday evening. Jerry spawned about a half a dozen tornadoes as it moved ashore and dumped locally heavy rains in extreme southeastern Texas and western Louisiana. However, the storm rapidly weakened inland and was downgraded to a low pressure center in southwestern Arkansas by Monday. Farther north, violent thunderstorms developed along and north of a warm front that extended across central lower Michigan eastward into western New York. Gusty winds, large hail, torrential downpours, and a few tornadoes accompanied some of the storms. A strong cold front slowly advanced southeastward across the nation's midsection as unseasonably cold air pushed southward out of Canada into the northern Great Plains. Moisture from the remnants of Jerry combined with the cold front and brought rain to the lower and middle Mississippi Valleys. By mid-week, heavy rains caused severe flooding in parts of the southern and central Appalachians, most notably in southern West Virginia, southwestern Virginia, and southeastern Kentucky. By Thursday, an upper-air low pressure center that developed over the lower Ohio Valley was responsible for record-breaking October snows that blanketed portions of the Ohio Valley and western Great Lakes. Up to 9 inches of snow fell on north-central Indiana while 6 inches accumulated in southwestern Ohio and eastern Wisconsin. Lesser amounts whitened parts of Kentucky, Illinois, and lower Michigan, but much of it melted as it hit the ground. To the east, heavy rains soaked much of the mid-Atlantic and New England. Extremely cold air pushed into the Deep South as readings at many stations plunged near or below freezing. Towards the end of the week, the complex storm system finally moved northward into Canada, bringing an end to the precipitation throughout most of the northeastern quarter of the country. Snow stopped falling over Michigan late on Saturday, but not before 13 inches had accumulated at Marquette, MI since Friday. In the West, light rain showers were reported along most of the Pacific Coast in conjunction with a new storm system moving into the Pacific Northwest. Shower activity decreased in Hawaii compared to the previous week while parts of the southeastern Alaskan coast received heavy rains.

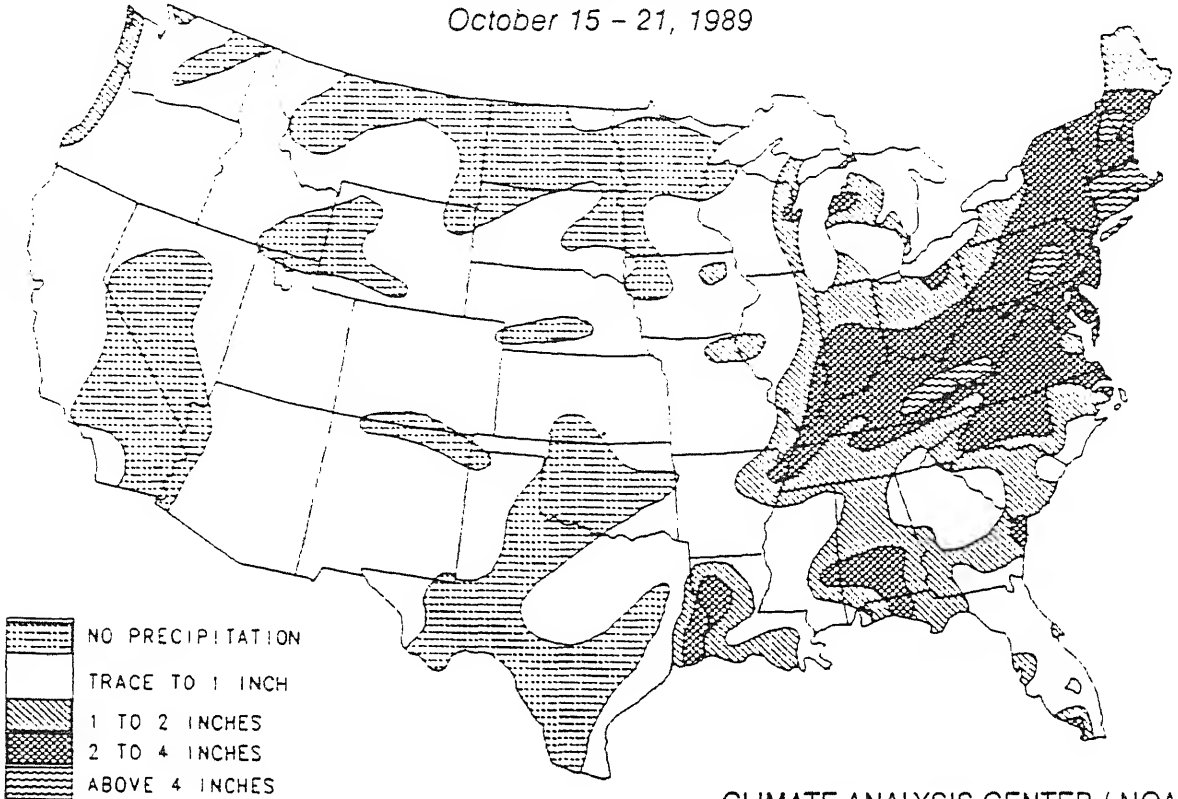
According to the River Forecast Centers, the greatest weekly totals (more than 4 inches) occurred in the eastern Tennessee Valley (see Figure 1), the south-central Appalachians, southeastern Georgia, across the eastern halves of New England and the mid-Atlantic, and in extreme southeastern Texas and western Louisiana from Hurricane Jerry (see Table 1). The excessive rainfall (up to 7.0 inches) throughout New England (see Figure 2) continued the wet weather pattern that has soaked this region since May (see front cover), while surplus precipitation has generally occurred in the Tennessee Valley since February (see Figure 3). Elsewhere, moderate to heavy totals were observed along parts of the Gulf and Pacific Northwest Coasts, in the upper Great Lakes, and in most of the remainder of the eastern third of the U.S. Light to moderate amounts were recorded along the Pacific Coast, in sections of the southern and central Rockies, the central Great Plains, and in much of the country east of the Mississippi River. Little or no precipitation fell on the desert Southwest, Great Basin, the southern Plains, and across the northern Rockies, Plains, and the upper Midwest.

Near to slightly above normal weekly temperatures were limited to the Far West and along the mid-Atlantic Coast (see Table 2). After a brief spell of "Indian summer" weather in the southern and eastern U.S. early in the week, colder air gradually invaded the area during the latter half of the period. The largest positive departures (between +4°F and +6°F) were reported in portions of the desert Southwest, along the immediate middle Atlantic Coast, and in south-central Alaska. In sharp contrast, unseasonably cold air covered the nation's midsection. Temperatures averaged 8°F to 10°F below normal in the central Plains, lower Missouri Valley, and upper Great Lakes (see Table 3). Dozens of daily minimum and several October extreme minimum temperature records were tied or broken during the week as freezing temperatures were reported as far south as the Gulf of Mexico and northern Florida (30°F at Tallahassee, FL on Oct. 21) while lows plunged into the teens in the northern and central Plains and upper Midwest. By the week's end, however, temperatures had rapidly moderated to near normal levels in the eastern half of the nation.

TABLE 1. Selected stations with 3.50 or more inches of precipitation for the week.

STATION	TOTAL (INCHES)	STATION	TOTAL (INCHES)
ISLIP, NY	6.65	SOUTH WEYMOUTH, MA	4.67
YAKUTAT, AK	6.13	WORCESTER, MA	4.34
JACKSON, KY	5.69	HARRISBURG, PA	4.30
HARTFORD, CT	5.58	BECKLEY, WV	4.02
BRIDGEPORT, CT	5.39	WILKES-BARRE, PA	3.88
CHICOPEE/WESTOVER AFB, MA	5.26	FT BELVOIR/DAVISON AAF, VA	3.87
CORDOVA/MILE 13, AK	5.20	NEW YORK/LA GUARDIA, NY	3.82
NEW YORK/KENNEDY, NY	4.86	QUILLAYUTE, WA	3.62
PROVIDENCE, RI	4.83	WASHINGTON/ANDREWS AFB, MD	3.61
MT. WASHINGTON, NH	4.83	ALBANY, NY	3.58
POUGHKEEPSIE, NY	4.80	NEWARK, NJ	3.54
LONDON/CORBIN, KY	4.68	CONCORD, NH	3.50

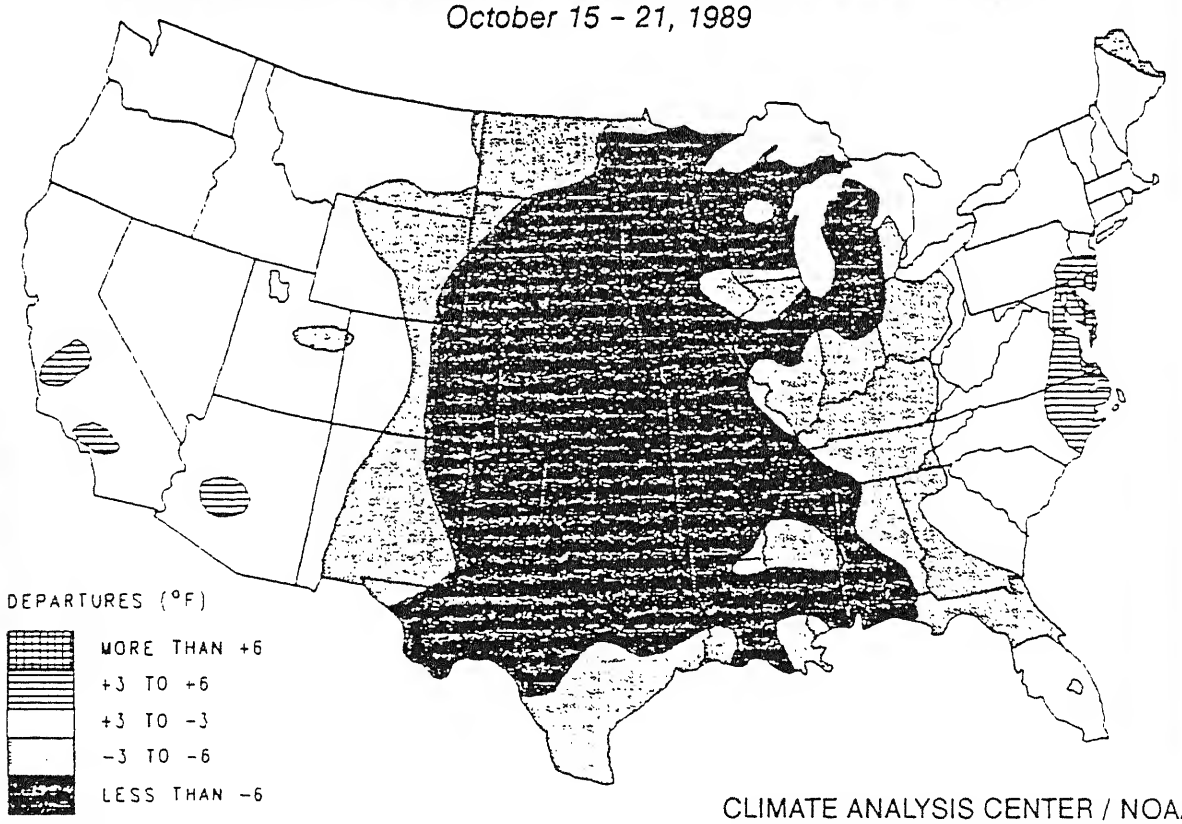
October 15 – 21, 1989



CLIMATE ANALYSIS CENTER / NOAA

DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)

October 15 – 21, 1989



CLIMATE ANALYSIS CENTER / NOAA

TABLE 2. Selected stations with temperatures averaging 4.0°F or more ABOVE normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
RENO, NV	-6.7	56.1	ADAK, AK	+4.6	46.7
SALISBURY, MD	-6.4	63.1	VICTORVILLE/GEORGE AFB, CA	+4.5	64.7
ATLANTIC CITY, NJ	-6.2	61.6	CORDOVA/MILE 13, AK	+4.4	43.8
HAMPTON/LANGLEY AFB,VA	-6.1	66.4	FRESNO, CA	+4.3	68.4
BARTER ISLAND, AK	-6.0	20.5	MILLVILLE, NJ	+4.3	59.5
VALDEZ, AK	-5.6	42.5	FAIRBANKS, AK	+4.3	28.1
NORFOLK, VA	-5.5	66.3	CAPE HATTERAS, NC	+4.2	68.7
DOVER AFB, DE	-5.5	62.5	MT. WASHINGTON, NH	+4.2	34.3
GLENDALE/LUKE AFB, AZ	-5.3	75.3	SANTA MARIA, CA	+4.0	64.3
PHOENIX, AZ	-5.2	77.8	WASHINGTON/DULLES, VA	+4.0	57.8
GULKANA, AK	-5.2	31.6	LEWISTON, ID	+4.0	55.0

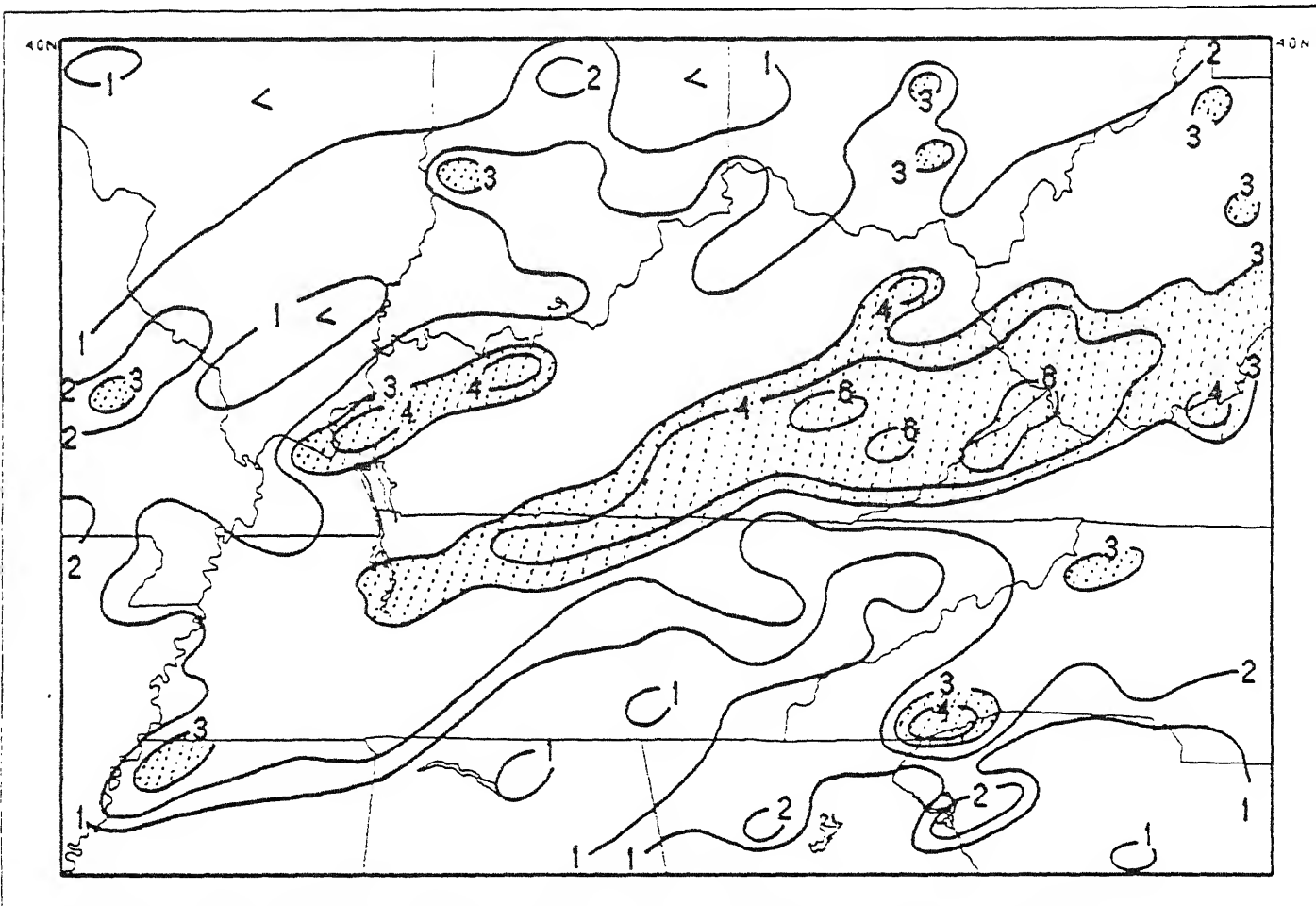


Figure 1. Total precipitation (inches) during October 15-21, 1989 based upon first-order synoptic, airways, and the River Forecast Centers stations. Isohyets are only drawn for 1, 2, 3, 4, and 6 inches, and stippled areas are more than 3 inches. Heavy rains soaked much of the Tennessee and lower Ohio Valleys last week and caused severe flooding in parts of eastern Kentucky, southern West Virginia, and southwestern Virginia. In southern Indiana and Ohio, some of the precipitation was in the form of light snow.

TABLE 3. Selected stations with temperatures averaging 8.0°F or more BELOW normal for the week.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
LA JUNTA, CO	-9.8	45.2	OKLAHOMA CITY, OK	-8.3	53.2
WATERTOWN, SD	-9.1	37.2	DODGE CITY, KS	-8.2	48.8
FORT DODGE, IA	-9.0	42.3	JONESBORO, AR	-8.2	53.7
SPENCER, IA	-8.6	40.4	WARROAD, MN	-8.1	35.1
SCOTTSBLUFF, NE	-8.6	40.9	HANCOCK, MI	-8.1	36.3
NORTH OMAHA, NE	-8.6	45.4	PARK FALLS, WI	-8.1	37.2
DENVER, CO	-8.5	42.6	ROCHESTER, MN	-8.1	40.1
OMAHA/EPPLEY, NE	-8.5	45.3	HURON, SD	-8.1	40.1
KANSAS CITY/INTL, MO	-8.5	49.8	GARDEN CITY, KS	-8.1	47.6
MEDICINE LODGE, KS	-8.5	50.8	GAGE, OK	-8.1	50.9
SIOUX FALLS, SD	-8.4	40.4	JOPLIN, MO	-8.1	51.3
VALENTINE, NE	-8.3	40.4	ELKHART, KS	-8.0	49.4
TOPEKA, KS	-8.3	48.6	CLOVIS/CANNON AFB, NM	-8.0	49.9
KANSAS CITY/MUNI., MO	-8.3	50.5			

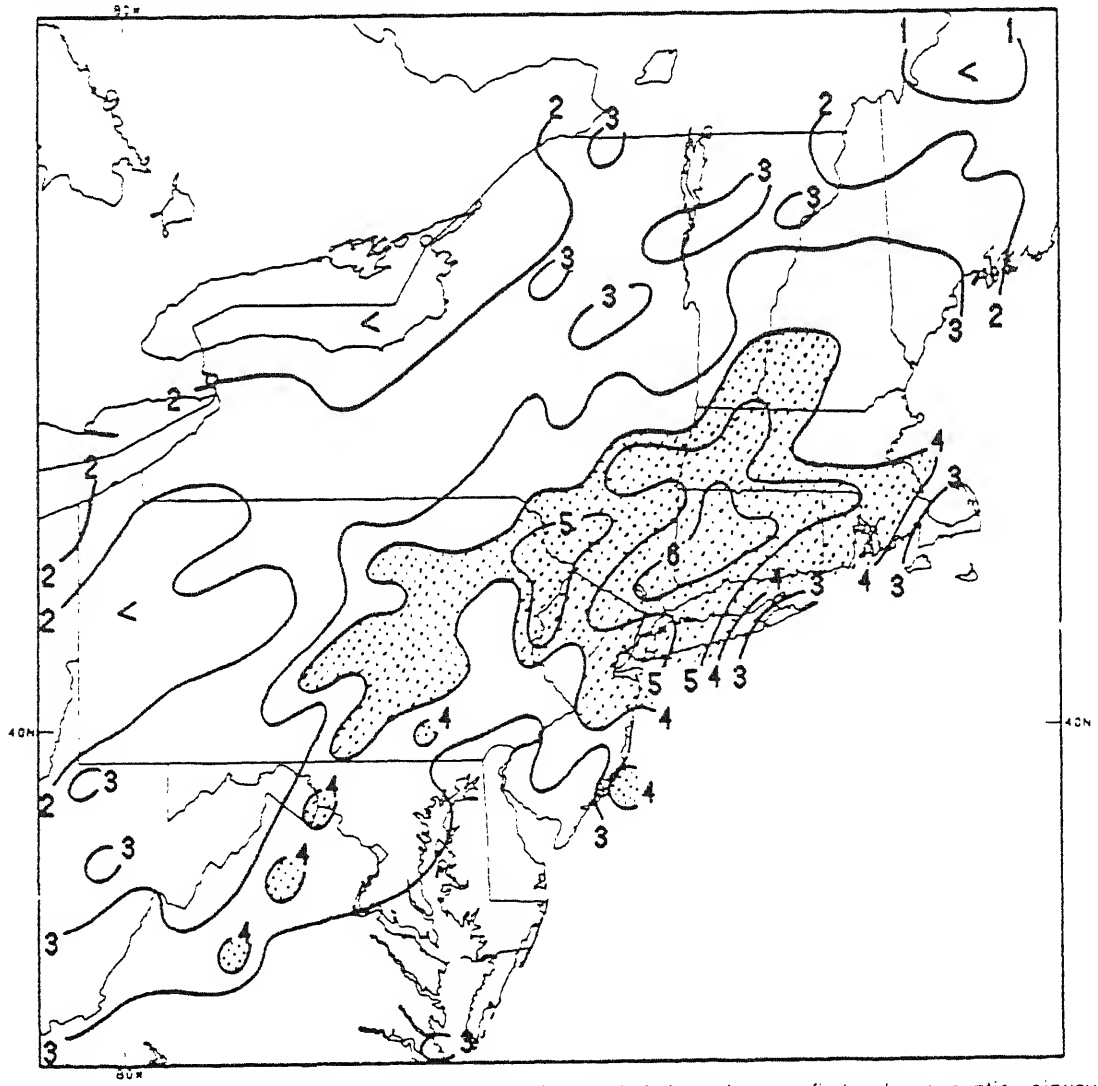
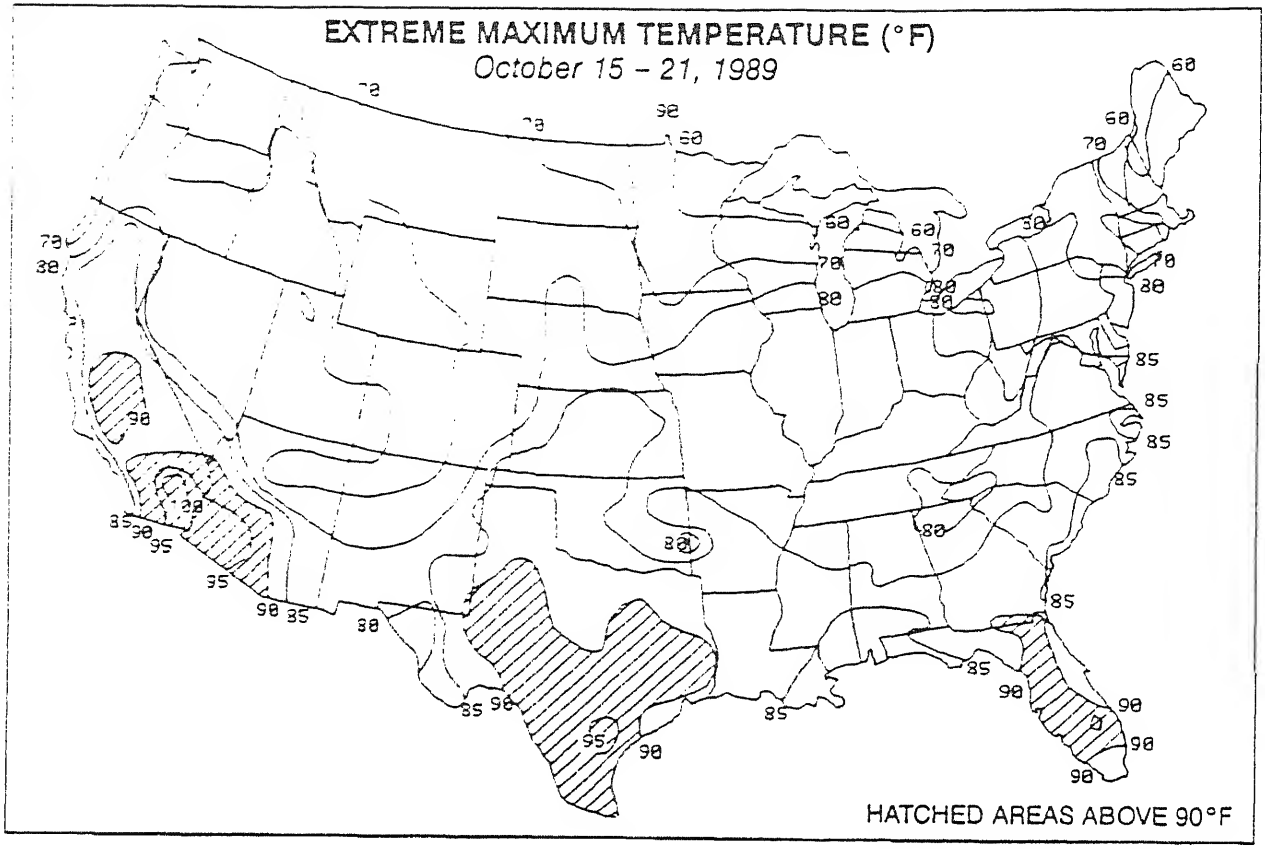


Figure 2. Total precipitation (inches) during October 15-21, 1989 based upon first-order synoptic, airways, and the River Forecast centers stations. Isohyets are only drawn for 1, 2, 3, 4, 5, and 6 inches, and stippled areas are more than 4 inches. After an unusually dry and mild winter, abundant rains fell on the mid-Atlantic and New England since mid-Spring and have continued through the summer and into the early autumn months. As depicted on the front cover, many stations have recorded over one and a half times the normal rainfall since May 1. Corresponding surpluses for the period exceeded 15 inches at several locations (not shown).



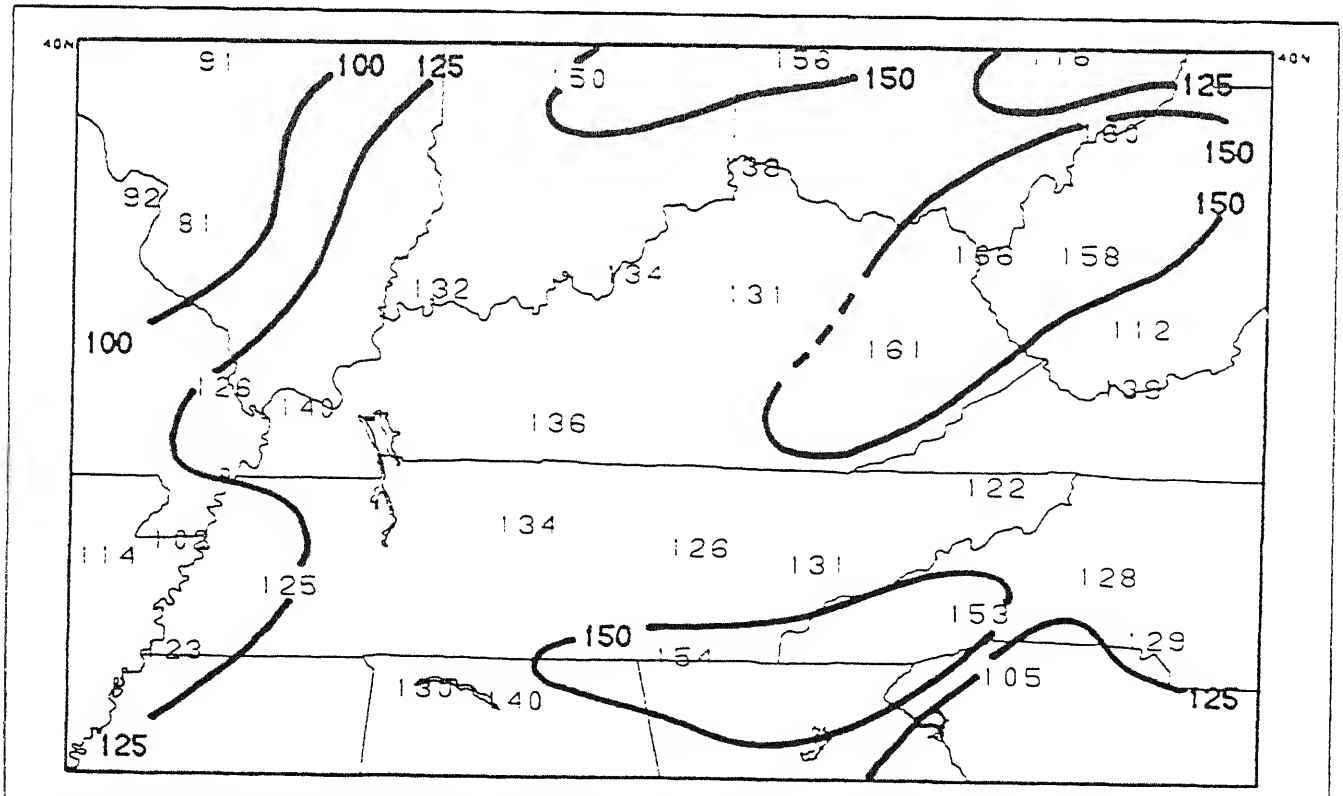
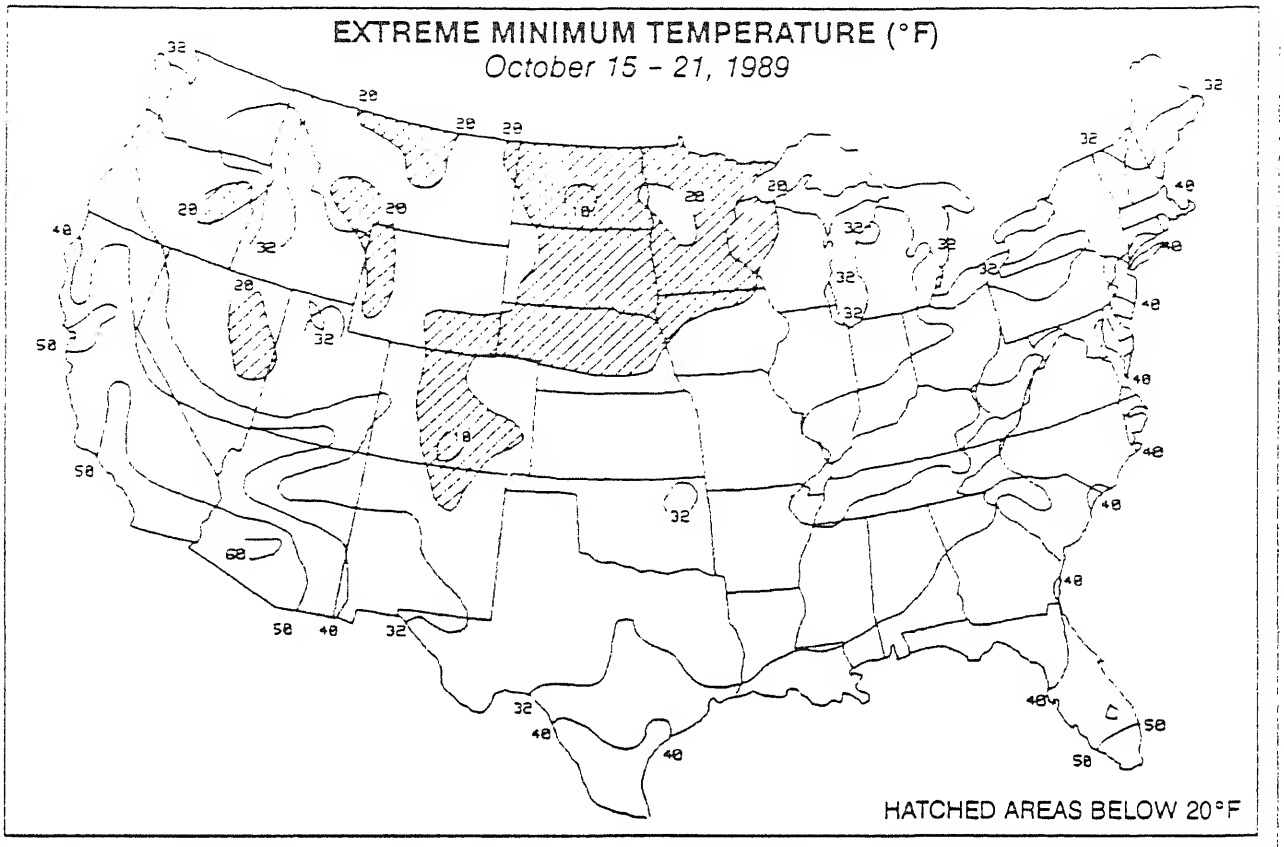
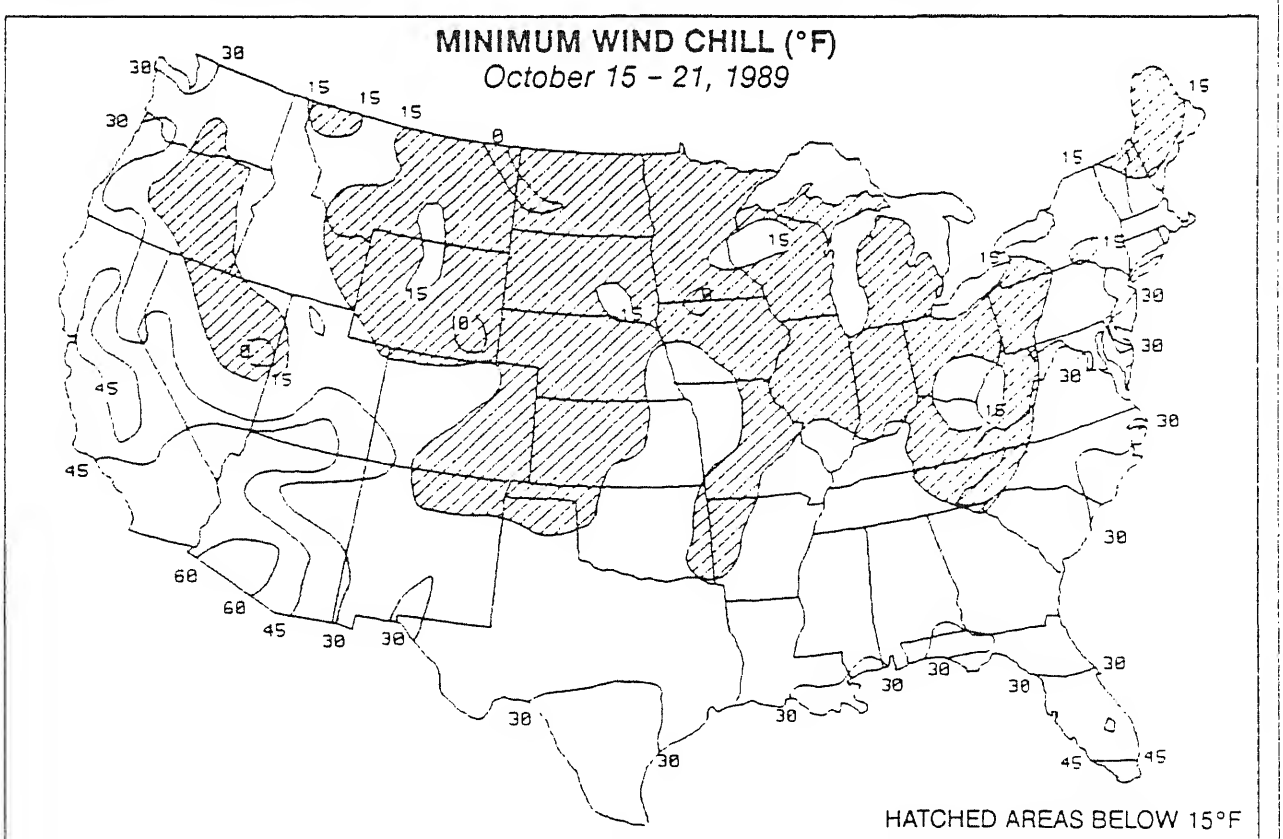
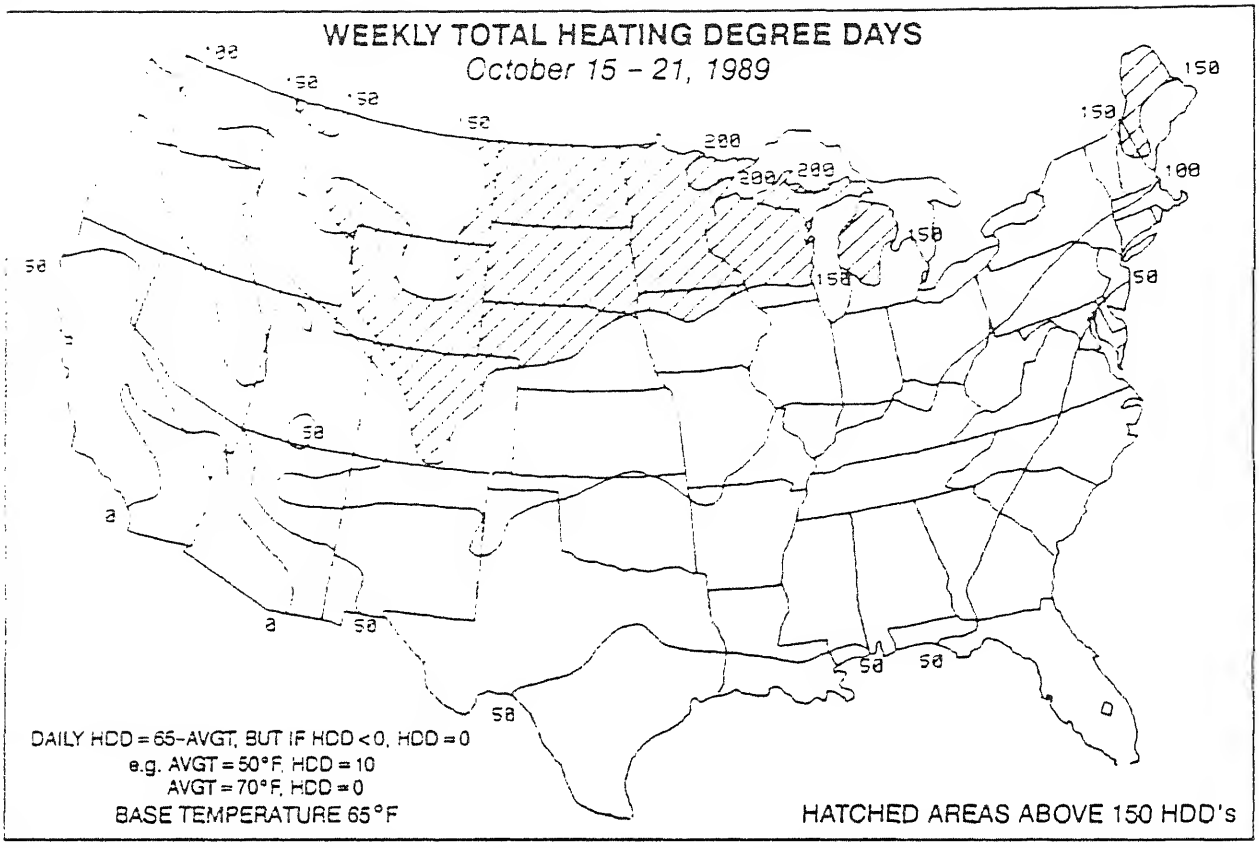


Figure 3. Percent of normal precipitation during February 1-October 21, 1989 based upon first-order synoptic and airways stations. Isopleths only drawn for 100, 125, and 150%. After experiencing several bouts of severe dryness during the past 5 years, abnormally wet conditions have afflicted the Tennessee Valley since early 1989. This has recharged the subsoil moisture and returned rivers and lakes to near normal levels, but has also caused episodes of severe flooding such as in eastern Kentucky this week. Similar to the Northeast, many locations have accumulated surpluses greater than 15 inches since February 1 (not shown).

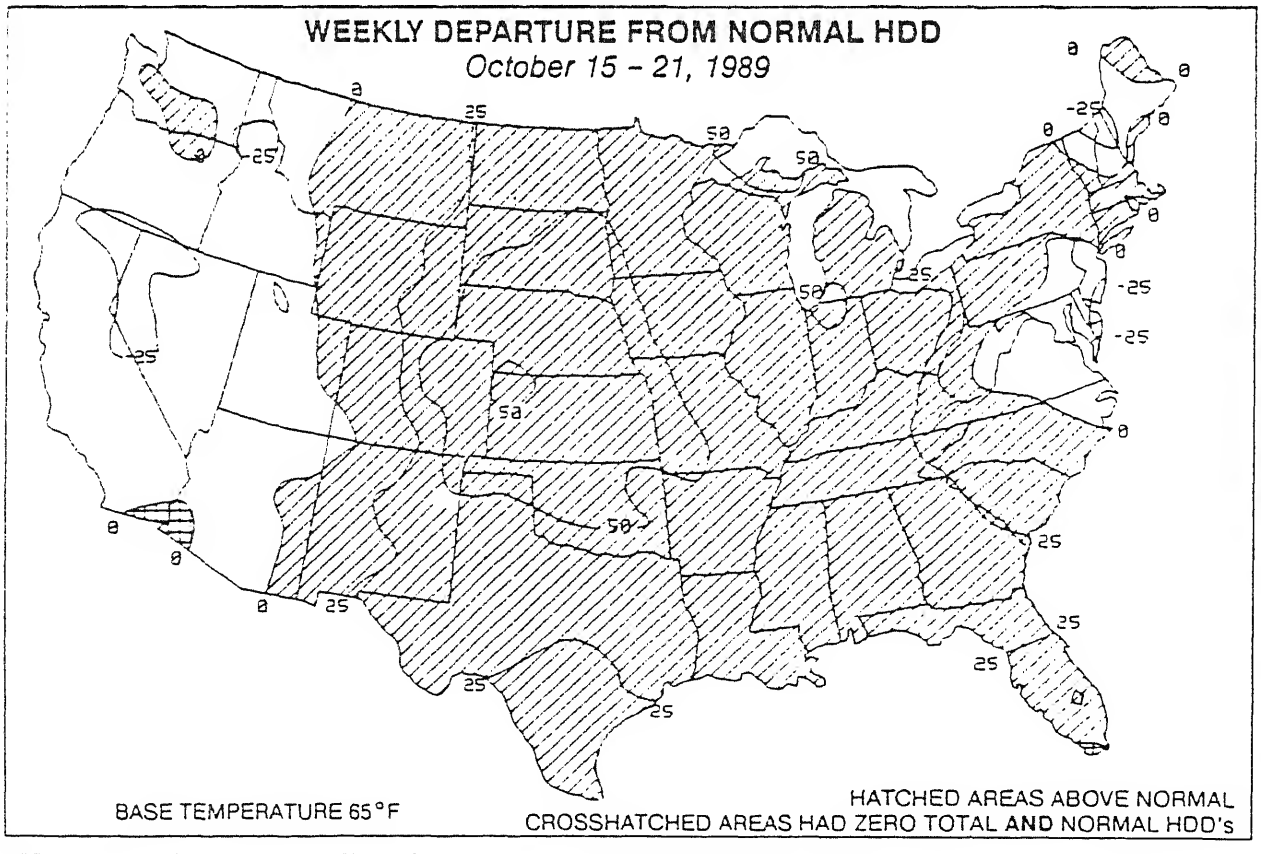


A blast of cold Canadian air sent temperatures into the teens in the northern Great Plains, upper Midwest, and portions of the northern Rockies while subfreezing readings pushed as far south as southern Texas, Louisiana, Mississippi, and Alabama (top). Windy conditions produced wind chills under 15°F across most of the north-central U.S. (bottom).



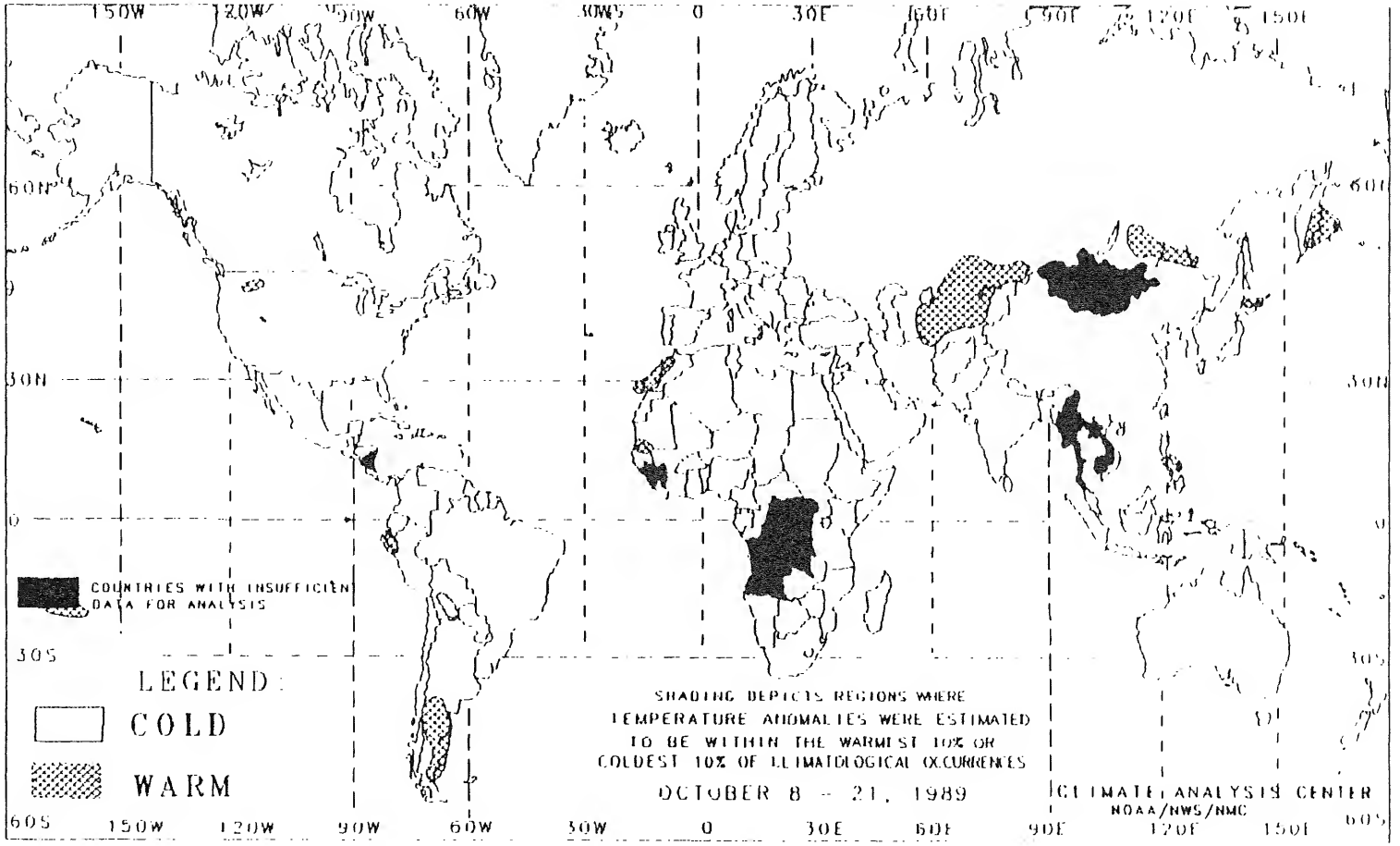


Unseasonably cold conditions pushed weekly heating usage above 150 HDD's in the northern Plains and upper Midwest (top). Cold air east of the Rockies kept heating demand above normal in most of the eastern two-thirds of the nation as the coldest regions (e.g., the central Great Plains) experienced one and a half times the normal weekly value (bottom).



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

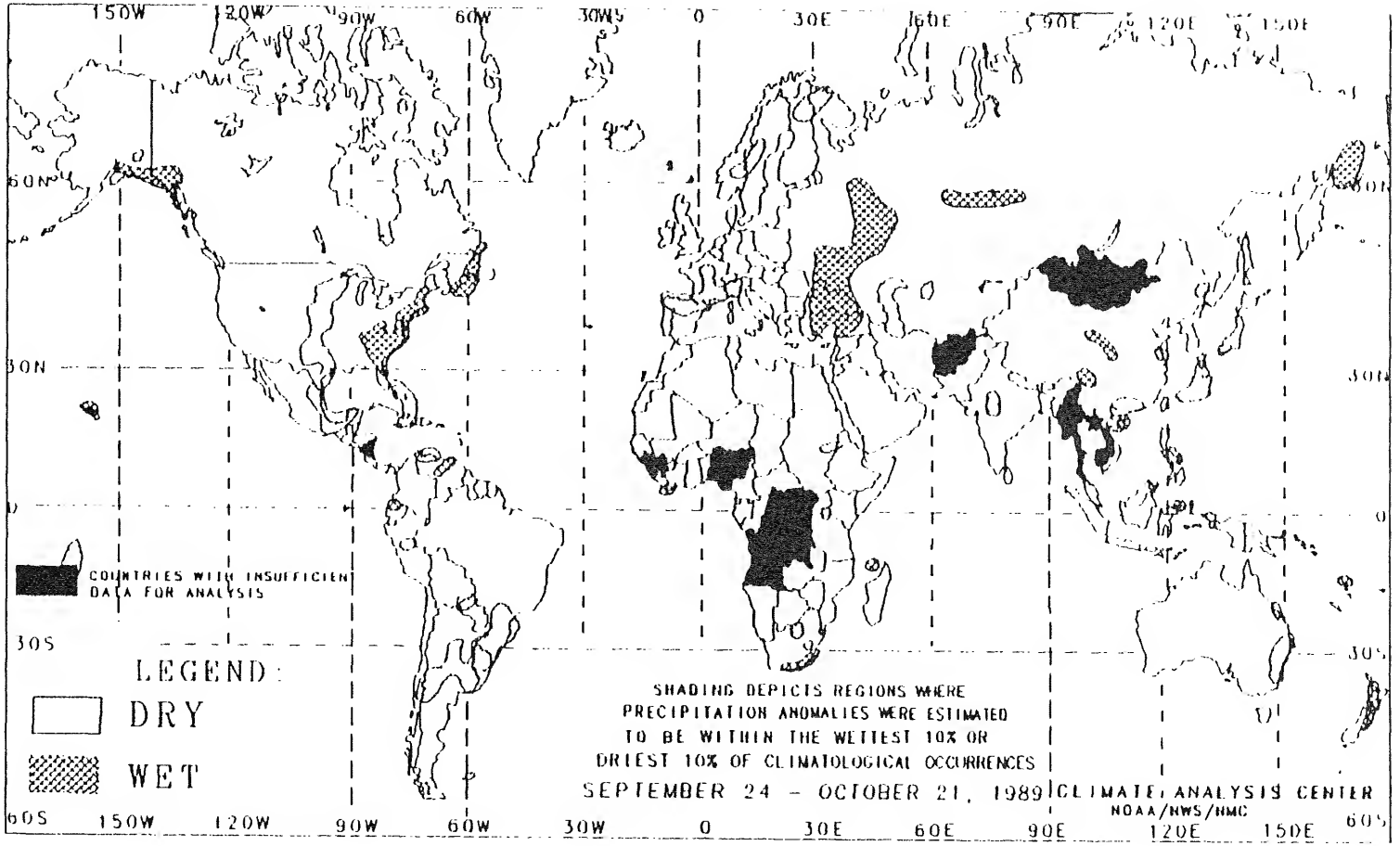
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

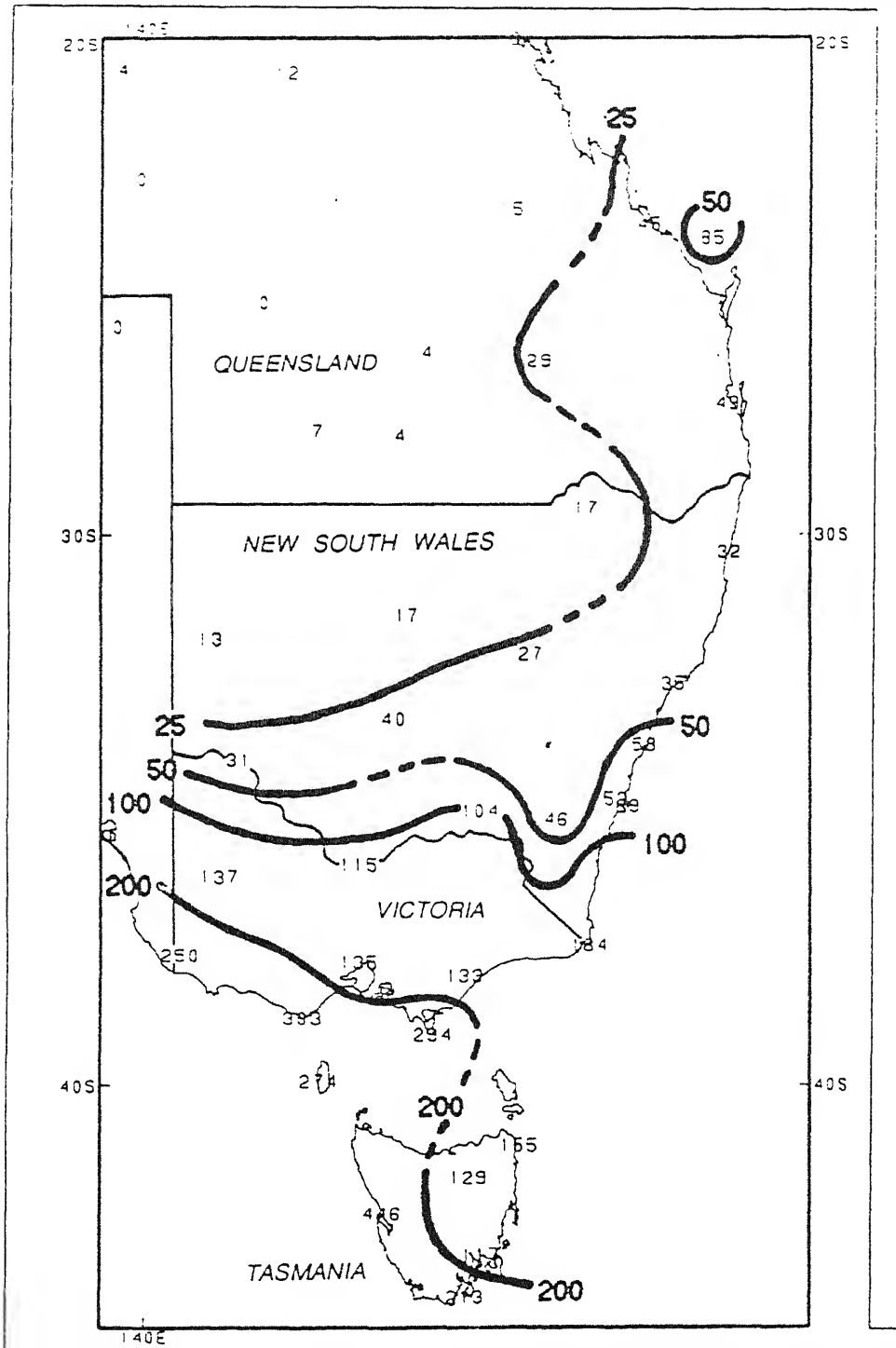
In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

SPECIAL CLIMATE SUMMARY

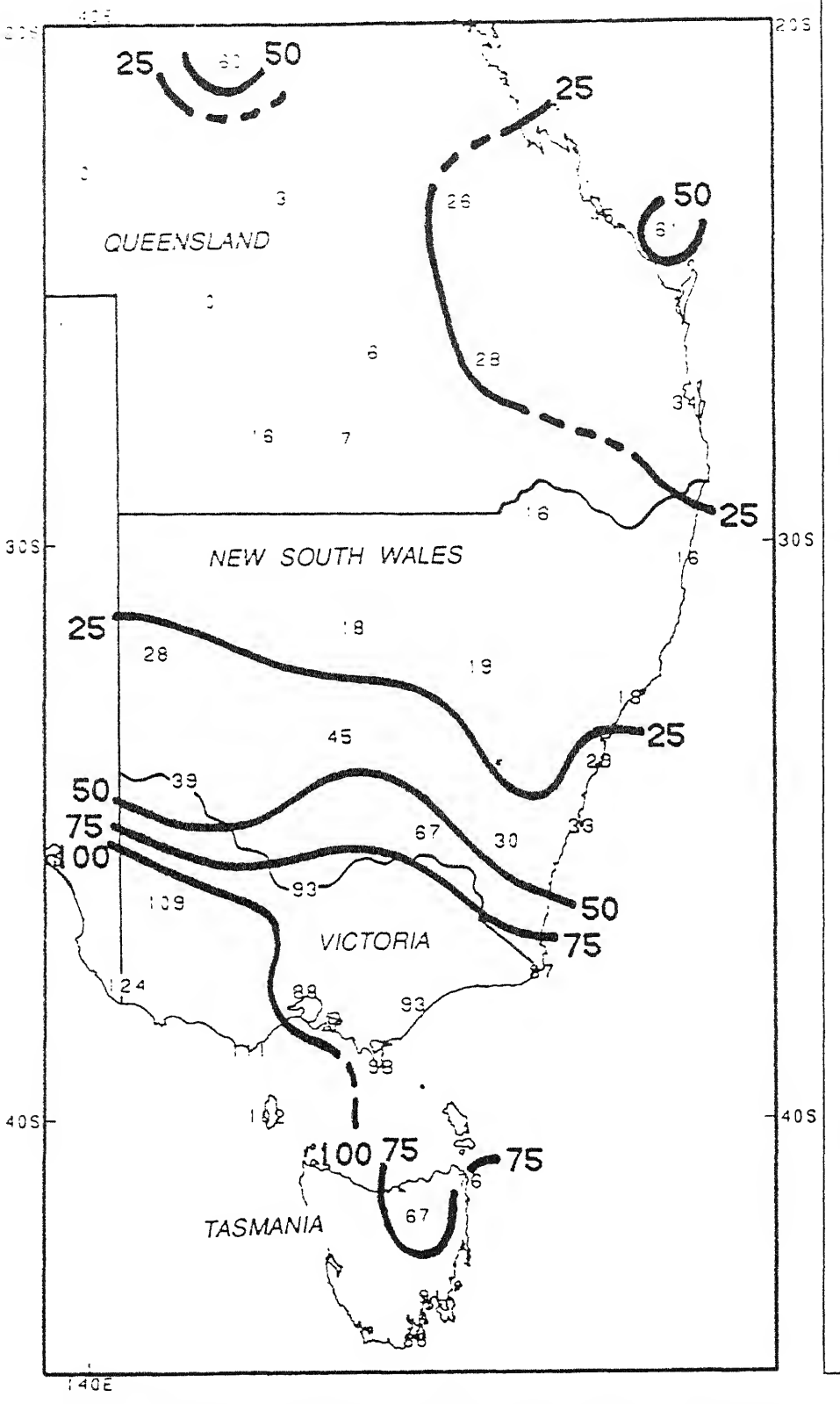
CLIMATE ANALYSIS CENTER, NWS, NMC
NATIONAL WEATHER SERVICE, NOAA, DOC

DRYNESS HAS AFFLICTED SOUTHEASTERN AUSTRALIA SINCE AUGUST 1 WHILE SPRING RAINS HAVE YET TO BECOME ESTABLISHED ALONG THE EASTERN COAST



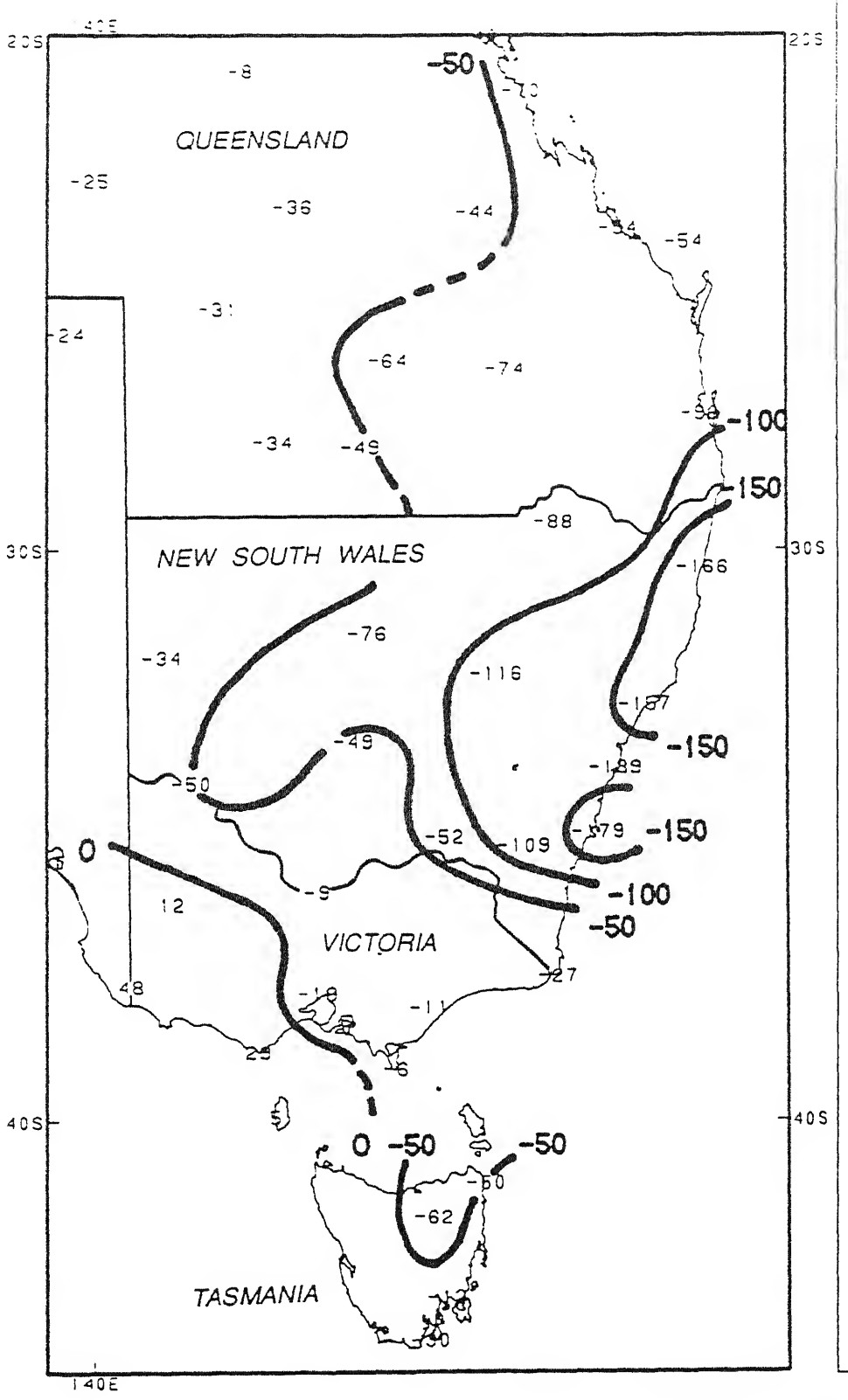
As briefly depicted on last week's front cover of the Weekly Climate Bulletin #89/41, unusually dry conditions have been experienced in southeastern Australia since August 1. In contrast to the remainder of the continent, where the bulk of the annual precipitation normally falls either in the summer (December–January) or winter (June–August) months, southeastern Australia's rainfall is more evenly distributed during the year (see Figure 4).

Figure 1. Total precipitation (mm) during August 1-October 21, 1989 (82 days). A station required 90% (73 days) or more of the days for inclusion. Even though normal rainfall is evenly distributed throughout the year in southeastern Australia, very little rain (generally less than 50 mm) has fallen on much of New South Wales and southeastern Queensland since August 1. In contrast



After much of the eastern half of the continent recorded excessive rainfall during March–June (headlined "The Big Wet" by the news media), seasonably dry weather finally returned to the northern and eastern portions by July. By August, however, rainfall also became sparse across southeastern Australia, specifically in extreme southeastern Queensland and most of New South Wales, and this dry weather pattern has persisted well into October. Additionally, the normal spring rains have not become established in east-central Queensland.

Figure 2. Percent of normal precipitation during August 1-October 21, 1989 (82 days). A station required 90% (73 days) or more of the days for inclusion. Less than half the normal precipitation has occurred in New South Wales and southeastern Queensland since August 1. Inadequate soil moisture has stressed the developing wheat crops currently in the heading to filling stages and the recently planted summer crops in much of the region.



Since August 1, most stations in New South Wales and southeastern Queensland have measured under 50 mm of precipitation (see Figure 1) and less than half the normal rainfall (see Figure 2). Deficits have exceeded 50 mm in southeastern Queensland and in much of the New South Wales interior, while some coastal locations are more than 150 mm below normal (see Figure 3). Farther south, most of Victoria and Tasmania have fared better and are near or above normal for the period.

As a result, there is great concern over inadequate soil moisture for the developing wheat crops currently in the heading to filling stages in New South Wales and southern Queensland, and for the recently planted summer crops in the east. The dry weather, however, has benefited sugarcane harvesting in northeastern Queensland.

Figure 3. Precipitation departure from normal (mm) during August 1-October 21, 1989 (82 days). A station required 90% (73 days) or more of the days for inclusion. Accumulated deficits have exceeded 50 mm across a large portion of New South Wales and southeastern Queensland, while coastal locations are more than 150 mm below normal. Farther north in east-central Queensland, with the approach of the usually wet summer months (Dec.-Feb.), deficits have been recently accumulating rapidly with the lack of significant rain and increasing precipitation normals.

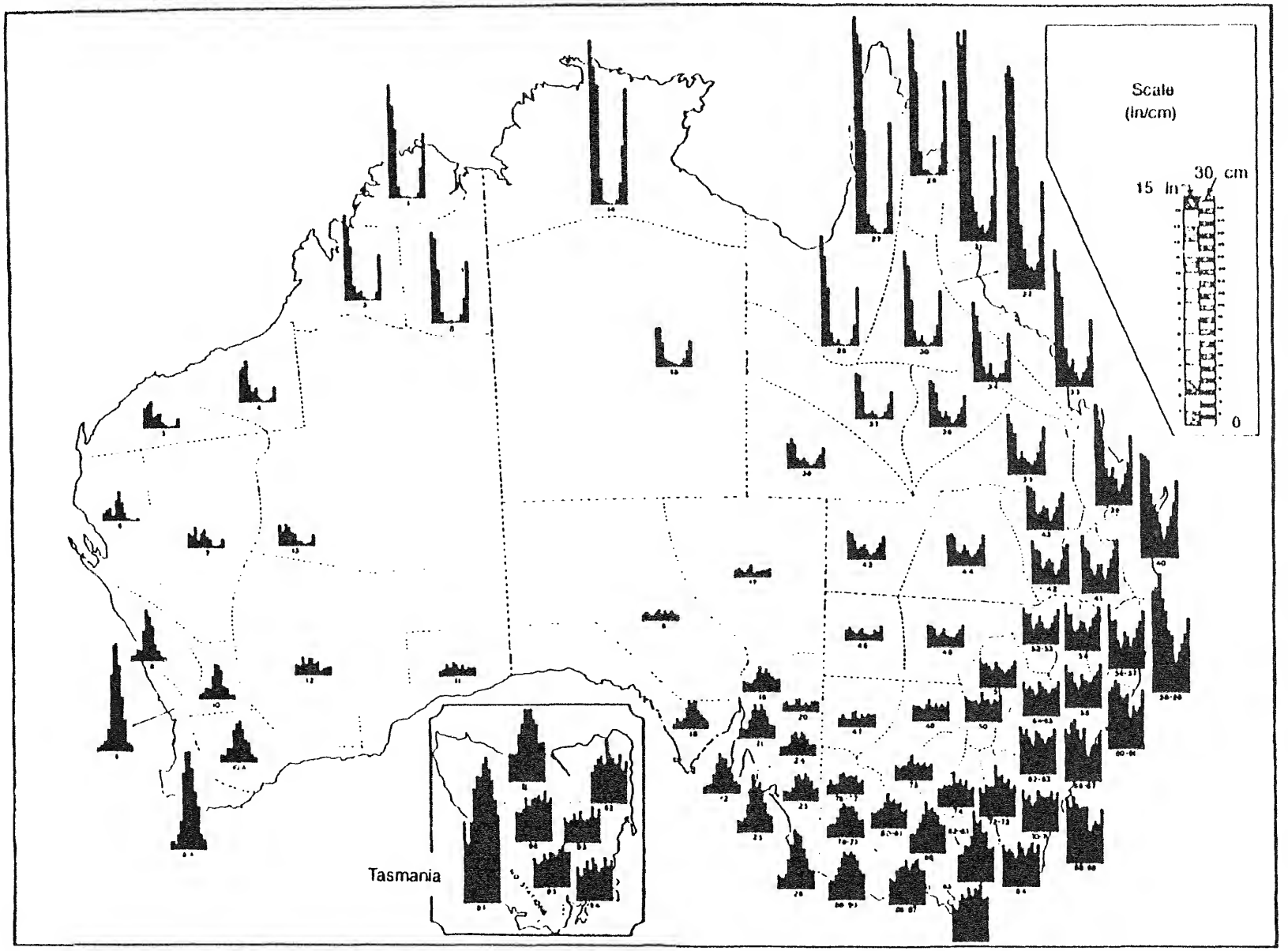


Figure 4. Monthly normal distribution of rainfall from the Bureau of Meteorology, 1982. The normal rainfall for each month of the year and for each district are depicted by a black column. The months follow from left (January) to right (December) in each district diagram. The amount of rain for each month is shown by the height of the respective column, and roughly corresponds to the scale in the upper right corner in inches (left side) and cm (right side). The upper column value is 30 cm. (15 inches), and the bottom of the scale represents 0. There is a summer (Dec.-Jan.) maximum and winter (June-Aug.) minimum across the northern half and along the east-central Australian coast, while the opposite holds true for southwestern and south-central Australia. In southeastern Australia, normal rainfall is more evenly distributed during the year. Very arid conditions usually exist in the continent's vast interior.